

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World.

Founder and Editor : STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list :

May 11	Lecture, "Low Power Flying," by Maj. M. E. A. Wright, before I.Ae.E.
June 23	Grosvenor Challenge Cup, Lympne
June 25-30 ..	International Air Congress, London
June 30	R.A.F. Aerial Pageant
July	Air Race for King's Cup
July 16	Unveiling of R.A.F. Memorial by H.R.H. The Prince of Wales
July 20	Göthenburg Exhibition
Aug. 1	Entries close from British Competitors for Schneider Cup
Aug. 3-14 ..	Rhön Gliding Competition
Aug. 6	Aerial Derby
Aug. 6-27 ..	French Gliding Competition, near Cherbourg
Aug. 8-12 ..	F.I.A. Conference, Göthenburg.
Sept.	Light 'Plane and Glider Competitions
Sept. 23 ..	Gordon Bennett Balloon Race, Belgium
Sept. 28	Schneider Cup Seaplane Race at Cowes
Oct. 14	Beaumont Cup Race at Istres, France
Dec. 1	Entries close for French Aero Engine Competition

INDEX FOR VOL. XIV.

The Index for Vol. XIV of FLIGHT (January to December, 1922) is now ready, and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C. 2. Price 1s. per copy (1s. 1d. post free).

EDITORIAL COMMENT.



AS far as the British section is concerned, the opening of the London-Berlin air route on April 30 was carried through with almost uncanny success to schedule time. A hitch apparently occurred in connection with the German side of the bargain, by which their machine was to have left the Tempelhofer Feld at approximately the same time that the Daimler Hire D.H.34 left Croydon. At present it is not officially announced what was the cause of the delay, but it is said to be connected with the German Government's subsidy arrangement with the German firm. However that may be, doubtless a start will be made before long, when there will be a through-service in each direction every Monday and Tuesday. At present the plan is to send a British machine from Croydon every Monday morning at 9.30, which, with stops at Amsterdam, Bremen and Hamburg en route, will arrive in Berlin about 6.30 p.m. The British machine will leave Berlin the next (Tuesday) morning and arrive at Croydon Tuesday evening. The German machine will follow a similar programme, apparently, starting from Berlin Monday mornings and arriving at Croydon Monday evening, leaving again for Berlin on the Tuesday morning.

Why this particular arrangement has been chosen is somewhat of a mystery. To begin with, by letting the machines start in opposite directions on the same days, there is a service on two days of the week only. Not only so, but a letter posted by air on the Monday's machine cannot be replied to by air mail, as the machine at the other end leaves before a reply can be got ready. Furthermore, it would appear that Monday is the worst possible day that could have been chosen. Letters posted in London early

Saturday morning for the ordinary mails are delivered in Berlin on the Monday afternoon or evening in the normal course of events. The same applies, of course, to letters to Amsterdam, Bremen and Hamburg. Thus the Monday's air mail offers no saving in time, unless the letter is written and posted outside ordinary business hours. To the ordinary business man it would seem that a better plan might be to dispatch the British machine from Croydon on Tuesday morning, returning to Croydon on Wednesday evening, while the German machine could be sent off from Berlin Thursday morning, returning to Berlin Friday evening. The week-end mails could then be taken care of by the ordinary service, without any loss of time.

That, however, is a matter which will doubtless be arranged as soon as the line is in proper working order, and in the meantime it is satisfactory to know that at last we are to have something more than the rather insignificant London-Paris route, which has served very well as a training ground and full-scale experimental establishment for the first faltering steps of civil aviation, but which cannot, unless linked up with other services farther afield, be of any great practical value. Time will show whether there is sufficient traffic on the London-Berlin route and its feeder lines to justify its continuation. Personally we have every confidence that the line will be a very successful one, and we congratulate the Director of Civil Aviation, General Brancker, and the Daimler Hire Company on having succeeded in making a start, in spite of very considerable obstacles and handicaps. How the new line, and any others that may be contemplated, will be affected by the Million Pound Monopoly Company, if and when that comes into being, is still a mystery outside official circles. We are frankly surprised that any firm has been found willing to do the spade-work on a new route, with such a threat as the Monopoly Company hanging over their heads. However, all the more honour to them. We trust this and other good work done by the pioneer companies will not be overlooked when it comes to consider their relations under new conditions.

Air Mails from Liners

The experiment of picking up mails from a liner and hurrying them to London by air, which was carried out on April 27, was not very convincing, although it was certainly successful. To begin with, the mails were "dummy mails," and they were picked up from "an imaginary liner." Thus there is still some speculation as to how long the aircraft would have taken to find and pick up the mail bag if this had, in fact, been dropped overboard. Also the fact that a motor launch was used, which would have to go out to meet the steamer and then return to Plymouth, there to hand the mails to an aeroplane waiting in a meadow, would cause unnecessary delay. What would obviously be done, in actual practice, would be to use an amphibian, which would meet the liner just outside Plymouth if the weather was rather rough, but off Land's End if the weather was fine, pick up the mail bags, and fly straight to Croydon. In very rough weather only might it be necessary to employ a pinnacle for "collecting" the mails.

Nevertheless, the demonstration was useful in showing that from the time a liner drops the mails outside Plymouth until they are at Waddon, ready

for transference to the continental air mail machines, no more than three hours need elapse, and that thus a very great saving in time can be effected. Some such system could be put into practice almost at once, and it is to be hoped that the Plymouth Chamber of Commerce, who organised the demonstration, will be encouraged by the results to press for the establishment of a regular service. It is, perhaps, not too much to hope that before long we should see the service extended to passengers in a hurry, but for a first start the difficulties of customs, etc., might be against this. When we get liners equipped with flush decks, as suggested recently in the paper by Sir Eustace d'Eyncourt, presented to the Institute of Naval Architects, more elaborate schemes will become possible, and instead of meeting liners at Plymouth, the liners themselves will carry aircraft, which will be dispatched while the liner is still from 100 to 200 miles out at sea. The saving in time will then, of course, be even greater.

Britain at I.L.U.G.

We are extremely glad that British participation on an adequate scale in the International Aero Exhibition and Flying Meeting (I.L.U.G.) to be held at Gothenburg from July 20 to August 12 is now ensured. After representations by the Society of British Aircraft Constructors, the Air Ministry has consented, or perhaps it would be more correct to say has succeeded in persuading the Treasury, to make a grant of £8,500 towards the expenses of sending a representative selection of British aircraft to I.L.U.G. Apparently a promise of an additional £1,000 has been made, should this prove necessary.

It may be argued that £9,500 will not go very far towards defraying the cost of sending machines to Gothenburg, but on the other hand, it is very much in the interests of manufacturers themselves—in other words, the S.B.A.C.—that British aviation should be well represented, and consequently it would not appear unreasonable if "the trade" had to contribute something itself. It should be remembered that it will be possible to send machines over by air, and that therefore the question of transport should not be a very serious one. Seaplanes and flying boats (we assume, of course, that this type of aircraft will be well represented, as the Scandinavian countries are particularly suited for seaplane work) could go direct, or at any rate reasonably so, by following more or less the various coastlines, while the land machines by flying over Holland, a corner of Germany, Slesvig, and Denmark, should not have to cover stages beyond their capacity.

While thus the British aircraft industry will be (let us hope) well represented, what about the Royal Air Force? We have repeatedly suggested that the time has come for the R.A.F. to take over on occasion the duty of "showing the flag." Gothenburg provides one such excellent opportunity, being not far from "home waters," and as other nations will be sending squadrons to the demonstrations and meetings to be held in connection with the exhibition, why should not we send a composite squadron of the R.A.F.? It is fairly safe to assume that such a squadron would be a revelation to most foreign air services, what with our excellent formation flying, sham fights, etc. From what we have seen of the services of other nations, the R.A.F., would be conspicuous by comparison, with considerable gain to British prestige.

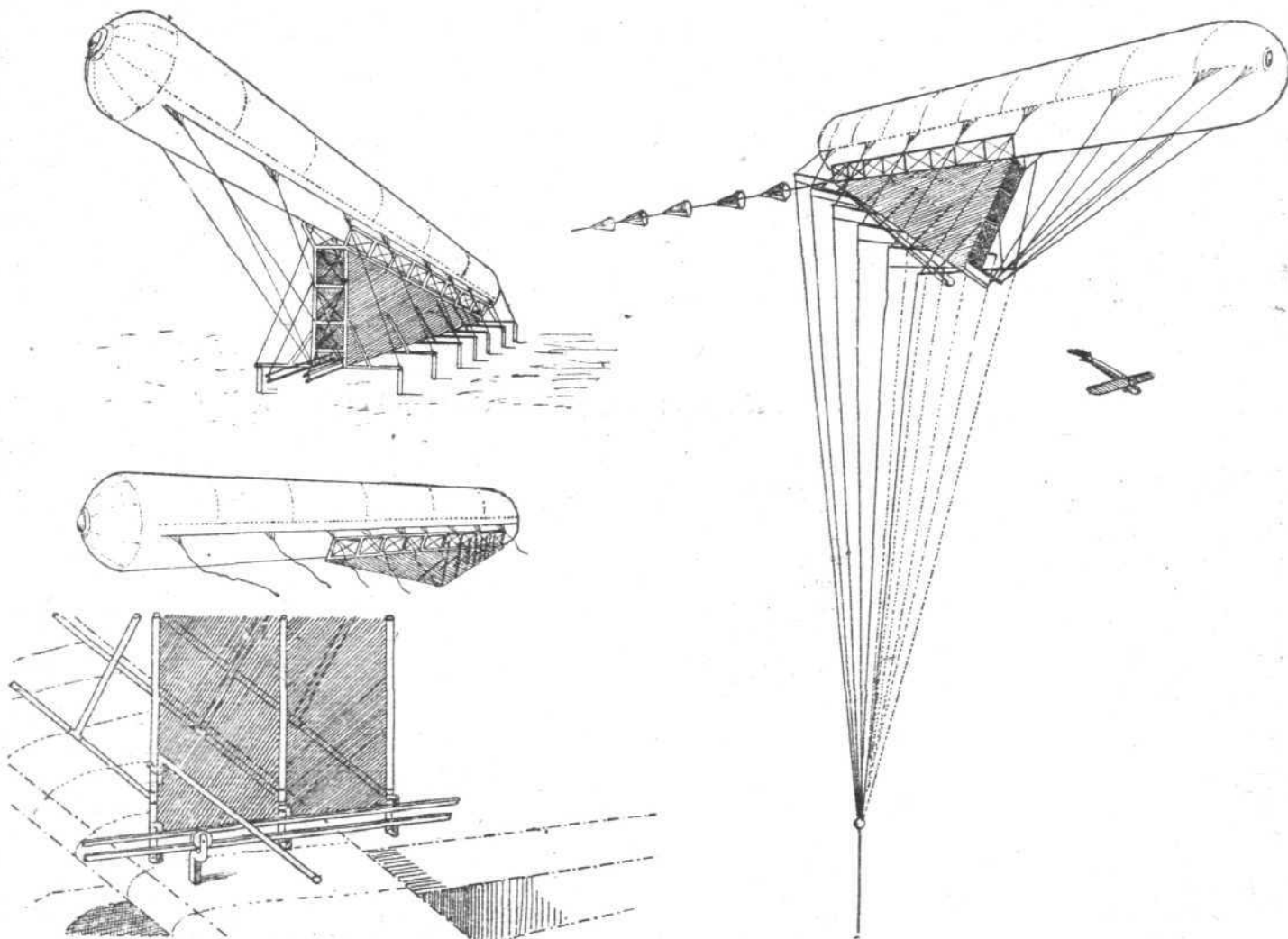
STARTING GLIDERS FROM KITE BALLOONS

A Novel German Scheme

AMONG the difficulties which restrict the wider adoption of gliding as a sport, not the least is formed by the necessity of a sufficiently high range of hills from which to make the start. Thus, in the case of London, the nearest range of hills is probably that at Itford, near Lewes, on the South Downs. There is little doubt that if facilities were available in the vicinity of London, many more would take up gliding as a sport. For instance, suppose that along one side of the Croydon aerodrome a range of hills existed, which rendered possible gliding and soaring on most days of the year. It is

although the machine was crashed. The experiment had, however, served to show in some measure the feasibility of launching a glider from a kite balloon, and Herr Oppermann has since been working on improvements in the starting arrangements.

Herr Oppermann's idea is shown, more or less diagrammatically, in the accompanying drawings. Suspended underneath the envelope of an ordinary kite balloon, and more or less taking the place of the curved scoop which runs around the tail of a Parseval type of kite balloon, is a light framework of



LAUNCHING A GLIDER FROM A KITE BALLOON : The upper diagram shows the balloon anchored to posts driven into the ground, ready to receive the glider. In the centre the balloon is shown with framework folded, ready for storing in a hangar. Below is shown a section of the double rails, with roller carried on a bracket on top of the glider.

LAUNCHING A GLIDER FROM A KITE BALLOON : This diagram shows the glider clear of the inclined rails.

scarcely to be doubted that in that case many amateurs would keep their gliders in the sheds at the aerodrome, and use every available opportunity to get in a bit of practice in gliding and soaring.

Realising that this necessity for a hill has hitherto been one of the main obstacles to the introduction of gliding as a sport, a Germany inventor, Herr Erich Oppermann, of Hanover, has conceived the idea of utilising a kite balloon for starting the glider. In fact, the experiment has already been made in Switzerland by Herr Klemperer, who was hoisted up to an altitude of some 2,000 ft. under a kite balloon, and then released his glider with the intention of planing down to earth. Owing to the primitive nature of the apparatus securing the glider to the balloon, and of the release mechanism employed, the start was not a success, and the machine got into a spin, from which Herr Klemperer could not extricate it, probably owing to the jamming of the controls after contact with some part of the balloon gear. Fortunately Herr Klemperer escaped with minor bruises,

wood or metal, the side walls of which are enclosed in fabric. Below this framework are transverse outriggers, connected to the envelope and to the framework by cables and struts. These outriggers serve for the attachment of the balloon cables, their object, of course, being to get the cables out away from the vicinity of the wing tips of the glider.

Carried underneath the outriggers, just inside the side curtains of the main framework, are two double rails which serve to guide the glider at the start. The glider is provided with brackets carrying rollers or wheels running between the upper and lower rails. The object of the double rails is to hold the glider down should a gust strike it as it is being launched. The rails are mounted at such an angle in relation to the balloon envelope that it forms a fairly steep angle, sloping down forward. The points of attachment, length of cables, etc., are so chosen as to give the right amount of slope. Owing to the "bag" formed by the lower part of the balloon envelope and the side curtains, assisted if necessary by the usual kite tail, the balloon will remain nose to the wind, and thus the glider may be released at any moment, being, like the balloon, always facing the wind. A quick release will be provided, so that the pilot can "cut loose" at any moment. Under the action of gravity the glider will

roll forward down the inclined rails, and it is thought that it will have sufficient speed by the time it is clear of the rails. The cables being then behind and outside the wing tips, it is thought that there should be no risk of the glider fouling any part of the balloon or its anchor cables.

Preliminary to an ascent the balloon is intended to be secured to a set of posts driven into the ground, of sufficient length to allow the glider to be wheeled under the balloon from behind and secured in the guide rails. The attachments of the outriggers to the posts are then cast off, and the balloon cable paid out, until the desired height is reached. As soon as the first glider has been launched the balloon is hauled down and a second glider placed under it and sent into the air.

Owing to the fact that Germany is not allowed to build or use kite balloons (although she may build airships up to a certain size), Herr Oppermann is unable to put his ideas into practice in Germany, and he has consequently come over to this country in order to attempt to form a syndicate for the exploitation of his patents. Herr Oppermann is also the inventor and patentee of a number of aviation instruments, several of which are, we understand, to be manufactured in this country. Anyone interested in the Oppermann glider-launching kite balloon scheme should communicate with him at the address of Messrs. A. Lege and Co., 45 and 47, Lofting Road, Liverpool Road, London, N.

Herr Oppermann has certain theories regarding the possibilities of "Dynamic soaring" as distinct from soaring in up-currents, and believes that his kite balloon launching arrangement will form a valuable means of ascertaining the

feasibility of making use of the internal energy of the air for "gust soaring." Quite apart from the scientific side of the problem, it would appear that from the sporting point of view a good deal might be done with the scheme. It should be possible to purchase surplus kite balloons at a very low figure, and their conversion should not be a very expensive undertaking. Thus one can imagine gliding centres established at various London aerodromes. Croydon might, perhaps, be out of the question, as it seems unlikely that the authorities would allow the flying of kite balloons from the terminal aerodrome, owing to the possible danger to the machines arriving from and departing for the Continent, but Cricklewood, Stag Lane, or Hendon should be suitable, and, to put it on the lowest level, glider descents from a balloon would probably prove an attractive feature of week-end aviation meetings. Either of the three aerodromes should be large enough and with sufficiently open country within gliding distance to enable machines always to make safe landings. It might even be possible for machines to leave one aerodrome at a good height and alight at one of the other two.

Once the feasibility and safety of this form of launching had been demonstrated by "stunt merchants," glider enthusiasts would probably come forward and form glider clubs, hiring shed accommodation and "lifts." At any rate the scheme seems worth examining, and those interested should write to Herr Oppermann at the address given above. We might add that the inventor is in this country for a few weeks only, so that it will be well to communicate with him without delay.

LONDON TERMINAL AERODROME

Tuesday morning, May 1

THE outstanding event of the week was the inauguration yesterday, by the Daimler Airway, of the London-Berlin Service. Capt. W. R. Hinchcliffe piloted the first through machine, which left the Aerodrome at 10.30 a.m.—being an hour late owing to bad weather conditions on the English and French coasts—with six passengers and a mechanic, arriving at Berlin at 6.40 the same evening. The German machine which should have flown from Berlin to London the same day was unable to make its journey, owing to a last-minute hitch between German Aero Lloyd and the German Government. It is understood that this is in connection with subsidies, and that, until the matter is settled satisfactorily, no German machines will be running. This also means that the German connection between Berlin and Amsterdam will have to be cancelled, at any rate, for the time being. The only service to Berlin, therefore, will be the Daimler Service every Monday, and the return flight from Berlin to London every Tuesday. I am given to understand that the Copenhagen connection is not affected, and that passengers leaving by the Daimler at 12.25 p.m. for Amsterdam will travel by train to Hamburg and from thence by air to Copenhagen, arriving at 11 a.m. the day following departure from London.

Air Mail Experiment

AN interesting air mail experiment, and one with far-reaching possibilities, was made during the week by the Instone Air-Line, when a D.H.9, piloted by Lieut.-Col. Henderson, carried a dummy packet of mails from Plymouth to London in the early morning. In order to make this experiment complete a steam pinnace was dispatched from Plymouth to meet an incoming American liner as it entered the Channel. The dummy packet of mails was supposed to have been dropped from the liner into the pinnace, which immediately returned at full speed to Plymouth. Here the

packet which contained actual letters was loaded on to the aeroplane, which left for London shortly after 7 o'clock, arriving at Croydon soon after 9 a.m. The letters were here franked at the post office on the Aerodrome, and were handed to the pilots of the machines leaving for Brussels, Cologne and Paris. At these places arrangements had been made for special messengers to meet the machines and deliver the letters in the various towns by hand. The saving by this experiment was as much as two or three days in relation to letters addressed to Cologne.

Gold by Air

THE K.L.M. continue to carry huge quantities of goods, amongst which bullion is the most notable. On one day this week, in fact, the amount of bullion, as represented by gold ingots, was so great that it was more than the full load for one machine, and in consequence, after some frantic telephoning, a portion of it had to be returned to London.

All the available private hire machines, both at Stag Lane and at Croydon, were booked up on Thursday last to carry photographs and films of the Royal wedding to various parts of Great Britain and the Continent. Some, owing to a late start caused by late delivery of the pictures to the aerodromes, were unable to make their destination before dusk, but where promptitude had been shown in delivering the pictures to the machines, all the journeys were successfully accomplished.

On Saturday the Daimler Airway had a full load of football enthusiasts from Manchester to London, and in order to accommodate these they altered the time of their return service from London to Manchester from 12.45 to 6.15, so that these air cup finalists would be the last to leave Bolton and the first to return.

The improvements to the Trust House are being pushed forward rapidly, and there is every possibility that the greater portion of them will be opened in time to deal with the Whitsuntide crowds of sightseers.

The Wireless Year Book for 1923

THE Year Book of Wireless Telegraphy and Telephony, which is published by the Wireless Press, Ltd., London, has steadily been increasing its "capacity" year by year, and the volume for 1923, just to hand, has attained truly remarkable dimensions—it is now some three inches thick! From which it can be gathered that a vast amount of information dealing with W.T. in all its branches is contained within its covers.

This 1923 edition has been completely remodelled, and has been divided into no fewer than 17 entirely separate sections, one of which, a directory of Shipboard Stations, contains 540 pages! There is included an interesting and compre-

hensive section devoted to Wireless in Aviation, dealing with Signalling on our Airways, Regulations and Procedure (General and Direction Finding), W.T. Air Stations and Call Marks.

In conclusion we should like to make the following constructive criticism. We would suggest that, if there be no technical objection to it, this stupendous compilation would be improved if the volume were paged consecutively 1 to the end, in addition to the sectional pagination. This would facilitate—or even eliminate—the present somewhat difficult procedure of finding any particular section. The Index should have both sectional and page references in each case, for which there is apparently plenty of space.

LIGHT 'PLANE AND GLIDER NOTES

It begins to look as if, after all, we may get considerable variety in the types of machines that will be entered for the light 'plane ("motor glider" in Dailymalese) competition to be held this summer. We have criticised the decision to award two prizes for the same performance, but already a third offer has been made, and accepted, of a £500 prize by Abdulla and Co., and there seems to be a possibility—one might even say a probability—that at least one more substantial prize will be offered, while there is little doubt that various smaller prizes will be forthcoming. If any subsequent prizes that may eventuate are awarded for features other than, but additional to, economy, some at least may be covered of the range of tests which we suggested, and really useful light 'planes should be evolved.

THE competition for the Abdulla £500 prize will be international, and, although the engine capacity is limited to 750 c.c., this seems to be the only restriction, apart from the preliminary test of transportability. Thus there is no restriction on the amount of petrol which may be used in the Abdulla competition, and it is, apparently, open to competitors to design machines specially for this, without attempting the Sutherland or *Daily Mail* economy competitions, although they are naturally entitled to try for these also, should they so wish. From this fact, it would appear that there is nothing in the rules to prevent competitors who have designed machines for the economy tests to fit smaller wings and have a try at the Abdulla speed test.

WE are not aware how it is intended to organise the speed contest. All machines might be started together, so as to give all competitors identical weather conditions. On the other hand, they may be allowed to start when and as often as they like, which would naturally result in a great deal more flying being done, as competitors would constantly attempt to improve on their previous best performance. From the point of view of the public, the latter method would undoubtedly be preferable, as tending towards more flying, i.e., greater interest, and, after all, not the least important part of this very promising competition will be that of getting the greatest possible number of people interested. It is scarcely to be doubted that after the meeting a very considerable number of the visitors who have followed the performances and behaviour of the various machines will have become convinced of the safety and economy, not to mention the sport and enjoyment, which the light 'plane provides. Consequently by so arranging the organisation that on every day of the week, unless weather conditions are impossible, machines will be in the air from morning to night (more or less), the interest should be sustained. Nothing tires the public so quickly as having to sit or walk about, waiting for something to happen.

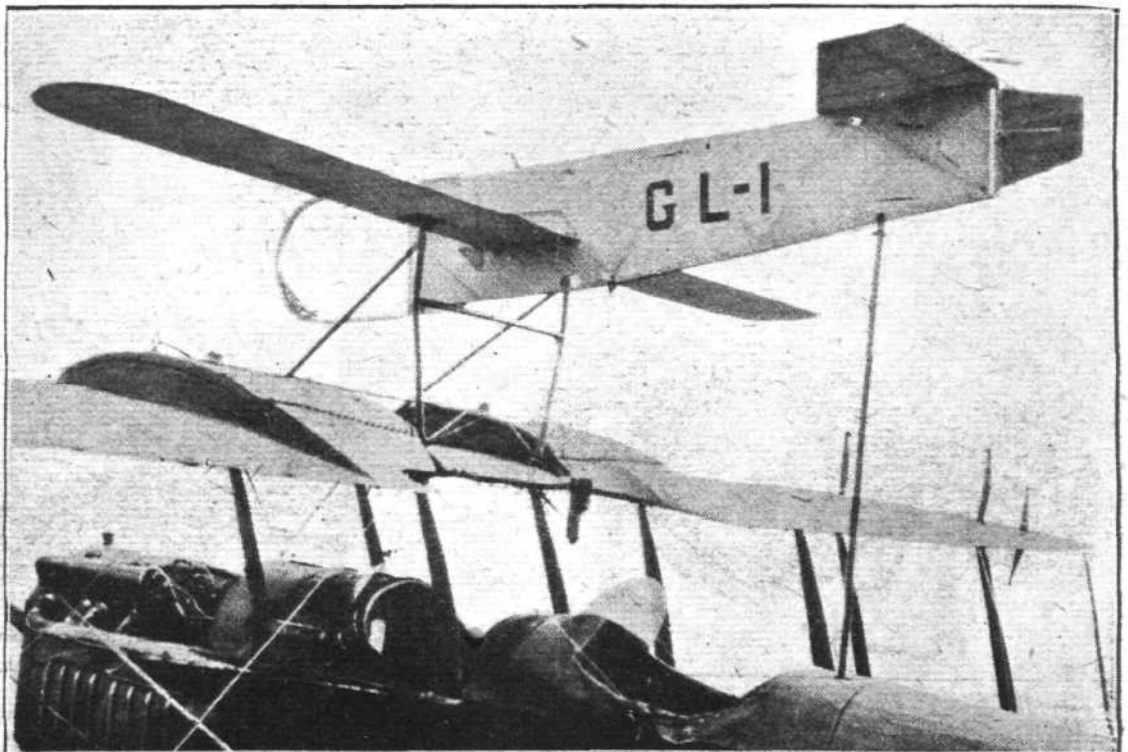
So far as we can see, whatever criticisms may be levelled at the decision to award the greater portion of the prizes for economy, we do not think the meeting is likely to be a dull one. In fact, it begins to look as if the week on the Downs, or wherever the meeting will be held, will be one of the most interesting in the history of British aviation, not excepting the Military Trials on Salisbury Plain in 1912.

WE understand that although the *Daily Mail* is awarding its prize for the same performance of mileage per gallon as that called for in the rules governing the competition for the Sutherland Prize, competitors will not be allowed to compete for both with the same flight. Presumably this means that before starting a competitor will have to state whether he is attempting the *Daily Mail* or the Sutherland prize. In the case of foreign competitors the problem solves itself, as they are not eligible for the Sutherland prize.

THE very fact that any one flight cannot cover the two competitions should in itself result in doubling the amount of flying, and thus is to be commended. The speed competition should ensure that some of the machines at any rate will be capable of speeds which will enable them to fight against a considerable head wind, which will be necessary for the light 'plane of the future if it is to be of practical use for cross-country flying. Even the "economical" machines, when fitted with small wings, should have a fair turn of speed, and thus it may be assumed that what between the "fast" machines, the "economical" machines, and the "economical-fast" machines, it may be possible to form a fairly clear idea of what the light 'plane for practical use should be like, even if none of the competing machines incorporates all features. The main difficulty as regards the "fast" machines will probably be climb. We can get good economy with high power loading and light wing loading. We can get reasonably good climb with high power loading and light wing loading, but we certainly cannot get any sort of climb with both high power loading and high wing loading. It will be interesting to see how the required compromise will be made. With an engine of 8-10 h.p. the best climb will probably be about 200 ft./min., corresponding to a climbing angle of about 1 in 20, or 3° (in still air). This is with light wing loading. With heavier wing loading it will certainly not be nearly as good, and may be 1 in 40 or 50.

THE next few days, or at any rate the next few weeks, will probably see the prize of 25,000 francs offered by *le Matin* won by a French pilot on a French machine. Barbot has the advantage over any other competitors that his machine has already been tested and flown for a considerable length of time. Apparently the only stipulation is that the engine capacity must not exceed 1,100 c.c. There is no restriction

American Target
Glider mounted
on an Aeroplane.



on the quantity of petrol that may be used, as is the case with the Blériot prize. Competitors must start from St. Inglevert, and a landing must be made at Lypne, where competitors must get their log books signed. The return flight to St. Inglevert must be made on the same day.

WITH reference to our remarks last week about the Anzani engine, we have no desire to belittle in any way the very fine effort of M. Dewoitine, but we think that, although far less fuss has been made of it, the "Wren" designed by Mr. W. O. Manning for the English Electric Co. must be admitted to be an even more admirable production from the point of view of economy. The "Wren" weighs approximately 380 lbs. "all on," and we know from the power curve published in *FLIGHT* recently that the maximum power is about 7½ h.p. at 4,500 r.p.m. As a matter of fact, the engine was never run at anything like this speed, but even judged on maximum power, the "Wren" carries $\frac{380}{7.25} = 52.4$ lbs./h.p. Compared upon a basis of useful work, the "Wren" seems to come out on top, as both machines are carrying the same useful load, i.e. one man, the one with an 1,100 c.c. engine and the other with a 400 c.c. engine.

FROM Paris it is announced that Mlle. Boland has entered a glider for the forthcoming gliding competition at Vauville, near Cherbourg.

IN America considerable progress is being made with the study of gliding. A committee was formed a short time ago

to report on the possibilities and suitability of various localities, and it is of interest to note that the American Air Services are taking up the subject. A short time ago the Engineering Division of the Air Service at McCook Field completed a glider monoplane with wire bracing somewhat similar to that of the de Havilland gliders. This machine, known as the GL 2, was given a few preliminary tests lately, but the flat country near Dayton is not very suitable for gliding. Nevertheless the glider made hops of about 300 ft., and on one occasion the two-wheeled undercarriage was removed to lighten the machine (there being no wind at the time, and consequently the machine could not be got off until it had been lightened). It was found that the central skid was sufficient for alighting, and that the machine did not heel over until it had come to a standstill. The wing tip skids were then sufficient to prevent damage to the wings.

ANOTHER recent development at McCook Field is the production of a target glider for use in training aircraft gunners. The target glider is quite a small affair, with a span of 12 ft. 6 ins. and an area of 18 sq. ft. The weight is 23 lbs. The machine is placed on the upper wing of an ordinary biplane, with a release which can be worked from the aeroplane. When the latter has reached the desired height the glider is released, the aeroplane hurries out of the way, and the gunners amuse themselves by trying to hit the glider before it reaches the ground. By suitable setting of elevator and rudder the target glider is stated to be capable of some very erratic flying, making it difficult to hit. This seems to beat our balloon sniping at Croydon.

◇ ◇ ◇ ◇ ◇ CYCLE ENGINES FOR LIGHT 'PLANES*

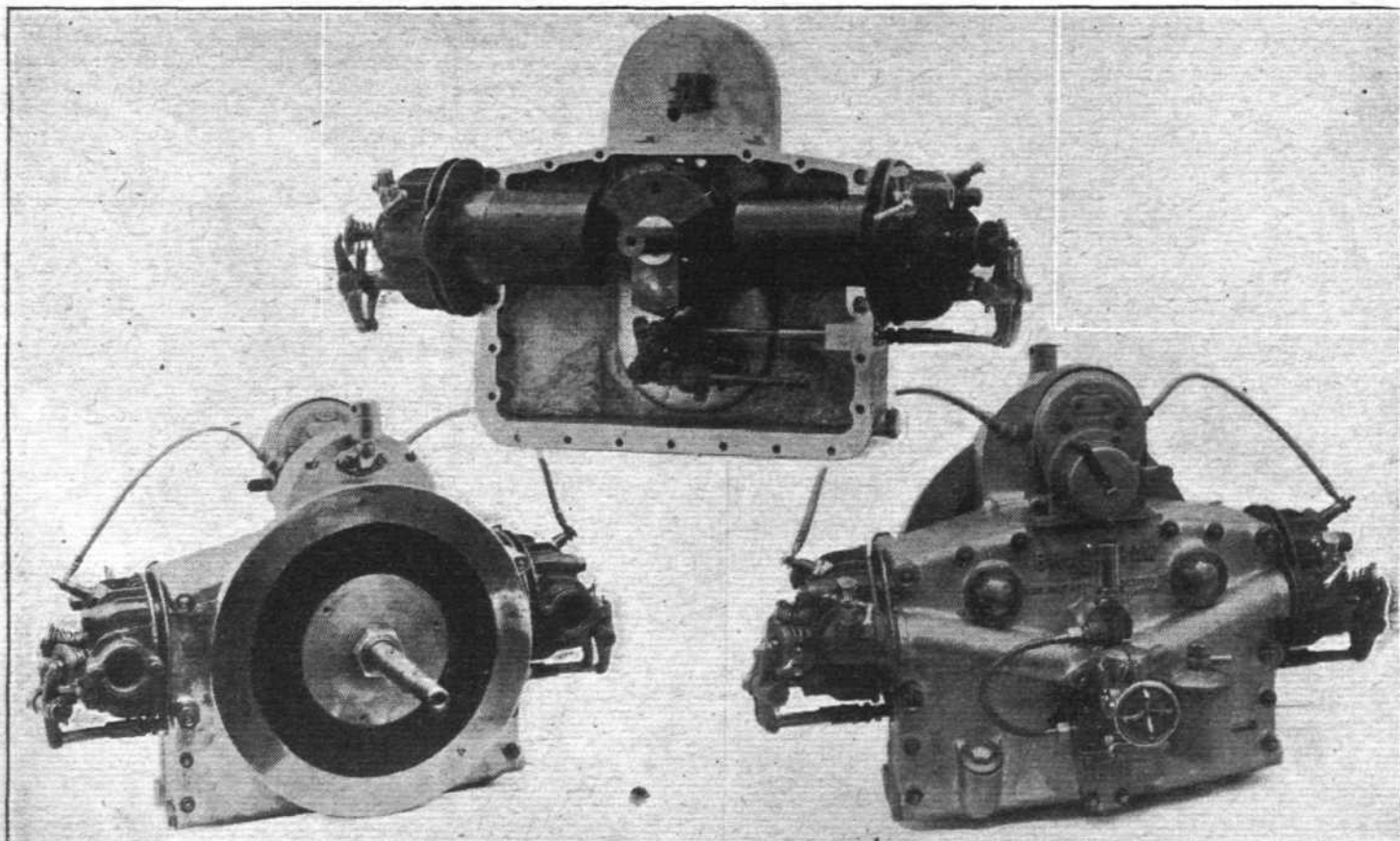
The Bradshaw 500 c.c. Oil-Cooled

OF very unorthodox design are the Bradshaw oil-cooled engines, of which two types are manufactured under licence by James Walmsley and Co., Ltd., Marathon Engineering Works, of Preston, Lancashire. Mr. Gilbert Campling, of 90, Jermyn Street, London, W. 1, is distributing agent, and will no doubt be pleased to show the Bradshaw engine to

anyone interested. The two types manufactured at Preston are a single-cylinder engine of 350 c.c. capacity, and a flat twin of 500 c.c. It is the latter which mainly comes into consideration for light 'plane work.

The main feature of the Bradshaw oil-cooled engine is that, with the exception of the cylinder heads, the engine is cooled by the lubricating oil, which is in turn cooled by radiation from the walls of the crank-case. The latter is of large proportions, and is roughly of box shape, divided into two halves

* Illustrated descriptions of engines in this series appeared as follows. The A.B.C. 400 c.c. and the Blackburne 700 c.c., April 19, 1923. The Coventry Victor 688 c.c., April 26, 1923.



THREE VIEWS OF THE BRADSHAW OIL-COOLED ENGINE: The cylinder heads and valve-rockers shown are those of the older type. The 1923 model has the rockers enclosed in a box, to ensure automatic lubrication.

along the centre line of the cylinders, the joint being, of course, vertical.

The cylinders are of cast iron, and are quite smooth as regards the portion housed inside the crank-case, the cylinder heads only being ribbed. The cylinder heads are attached by four bolts, and can be very easily removed for decarbonising and grinding-in of valves. Overhead valves are, of course, employed, and a special oil-bath rocker-box is provided, by means of which the valve rockers are automatically lubricated. These rocker-boxes are an innovation on the 1923 model, and, as the accompanying photographs illustrate the earlier model, the old type of rockers are shown. The line drawing, however, shows the rocker-boxes.

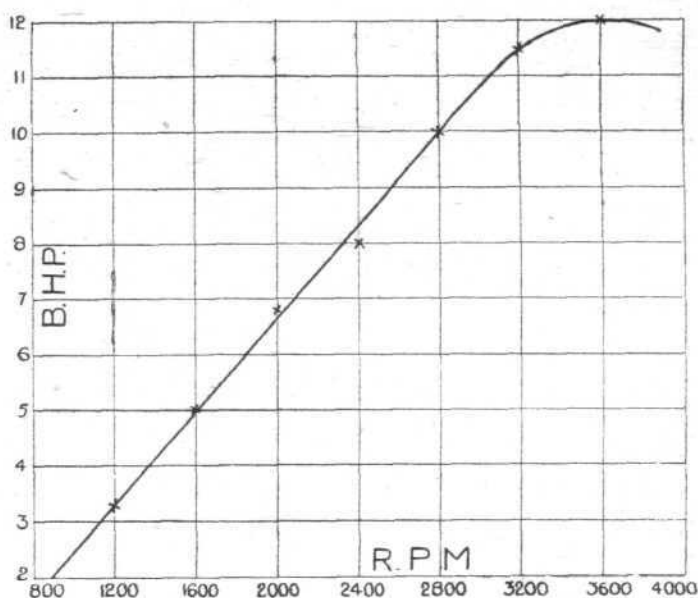
The crankshaft is of the two-throw, 180° type, with balance weights, as indicated in one of the photographs. The camshaft, fingers, tappets, etc., are enclosed in the crank-case, and are consequently always well lubricated. Special packing reduces any oil leakage past the tappet rods to a minimum, and altogether the Bradshaw oil-cooled engine is about as clean as it is possible to get an engine. Another feature which is of advantage for air work is that the valves are so placed that, when the engine is mounted in the machine with the flywheel side foremost, as it naturally would be, the exhaust valves are facing the air current and getting the maximum of cooling, while the induction pipes, cast integrally with the crank-case, and inlet valves are at the back of the engine. The valves, which are made from nickel-chrome steel, are of the "tulip" type, and are interchangeable. They are of large diameter, so as to give a free flow for the gases, and, although requiring but little attention, ample provision is made for adjustment, this being effected at the point where the tappets issue from the crank-case, *i.e.*, in a position readily accessible.

Aluminium pistons are used in the Bradshaw oil-cooled engine, and are provided with two rings, the one in the skirt being chamfered so as to collect and return any surplus oil through a series of small holes drilled in the skirt immediately under the ring. The gudgeon pin, which is tubular and of large diameter, floats in the piston bosses, and is prevented from scoring the cylinder walls by brass pads at the ends. I-section connecting rods are used, and plain bearings in preference to roller bearings, as providing easier adjustment and cheaper replacement.

Owing to the fact that the oil is used for cooling as well as for lubrication, the lubrication arrangement is naturally

oil is splashed on to the cylinder walls, the inside of the pistons, to the valve gear, etc., and it is claimed that the whole oiling system requires no attention.

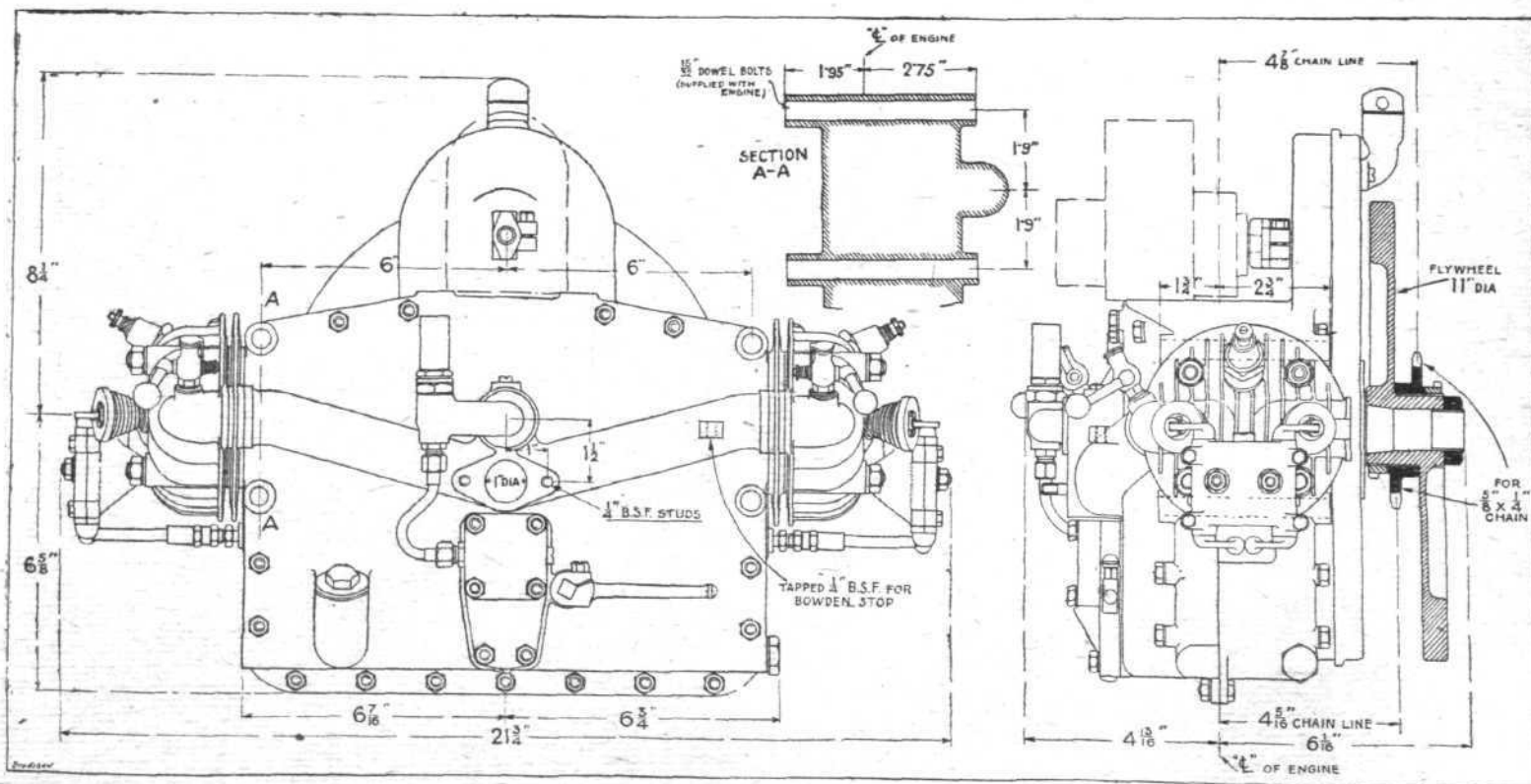
From the accompanying power curve it will be seen that the 500 c.c. Bradshaw engine develops a maximum of about



Power curve of the Bradshaw oil-cooled engine.

12 h.p. at 3,600 r.p.m. This curve was, we understand, obtained from a standard quantity production engine, and by special tuning better results can be got, one engine having developed 18 b.h.p. Run at speeds of 2,500 to 3,000 r.p.m., the engine develops in the neighbourhood of 11 b.h.p., and this is the speed recommended by the makers.

We are informed that the weight of the Bradshaw oil-cooled engine is about 49 lbs. without flywheel, magneto and carburettor, but that this can be reduced to about 46 lbs. In any case, the engine should be assumed to weigh approximately 70 lbs. in running order, and, although this is rather



General arrangement drawings of the 500 c.c. Bradshaw oil-cooled engine.

somewhat unusual. Driven from the camshaft is a gear pump, which draws oil from the sump in the crank-case through a large gauze filter, and delivers it under pressure to the internally drilled crankshaft. By a special system of oil release grooves the flow of oil through the crankshaft and from the big ends has been increased by 100 per cent., so as to give cooling as well as lubrication. From the big ends the

a high figure for the size, a matter of 10 or 15 lbs. will not materially affect the performance of a machine.

With regard to the form of transmission adopted, from the drawings it will be seen that the chain sprocket can be placed either inside or outside the flywheel, and with but little alteration it should be possible to incorporate direct drive, so that there is considerable choice in this respect.

“FLIGHT” GLIDER DESIGNING COMPETITION*
“TURKEY BUZZARD”

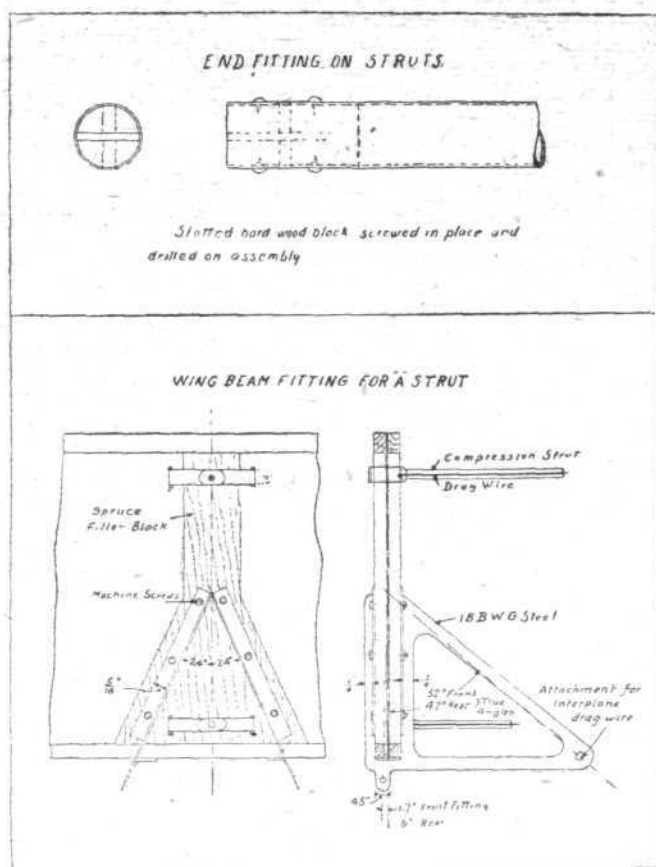
WING FITTINGS

GENERALLY speaking the wing design calls for practically no metal fittings. The few fittings required for the internal drag bracing are of the simplest form, *i.e.*, plain strips of sheet steel of light gauge, passed through slots in the spar webs and having their ends splayed out at the required angle. One such fitting is shown in one of the drawings published this week, dealing with the fitting for the "A" struts which secures the centre section of the wing to the fuselage.

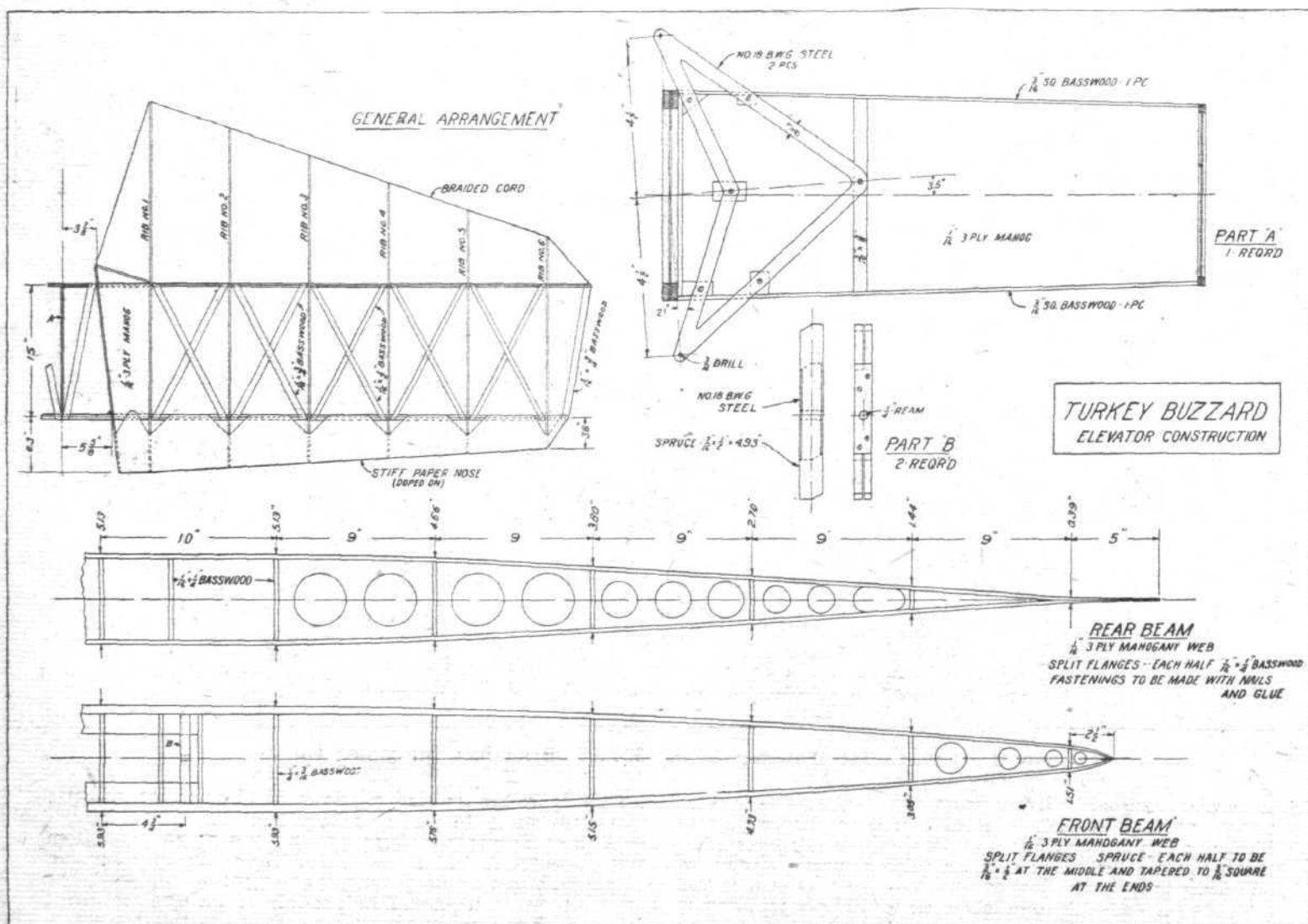
This drawing shows fairly clearly the "A" strut fitting, which is composed of two separate pieces of sheet steel, cut to shape from the flat and with flanges bent over as shown. A little more detail would not have been out of the way, but it should be possible to manage. The flanges securing the fittings to front and back of the spar are of such width that they can be formed by making a saw-cut down the fitting parallel with the centre line of the spar, and then bending the flange at right angles to the sheet from which the fitting is made. The long projection marked "Attachment for interplane drag wire" is, of course, for the wires corresponding to the incidence bracing of the centre-section of a biplane—that is to say, from it wires run to the top longerons of the fuselage, from front spar to foot of rear "A" strut, and from rear spar to foot of front "A" strut. Reference to the general arrangement drawings published in our issue of April 12 should make the arrangement clear.

On another sheet of drawings is shown one of the very simple fittings by means of which the lift struts are attached to the wing spars. Two strips of sheet steel form a fork which passes over the spar, a $\frac{1}{4}$ -inch bolt securing the ends of the fork to the spar web, which is reinforced by spruce filler blocks of the shape shown. We cannot say we particularly like this fitting, and we should have preferred it to be in the form of a stirrup passing over the top of the spar without

* The general arrangement drawings of "Turkey Buzzard" were published in our issue of April 12, 1923. Performance calculations, fuselage construction details, etc., on April 19, and details of the wing construction on April 26.



"TURKEY BUZZARD": Wing spar fitting for "A" struts, and end fitting for tubular lift struts.

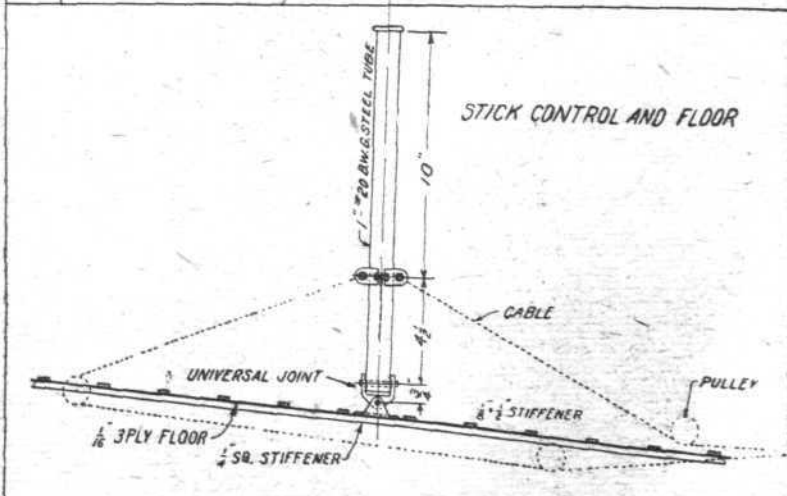
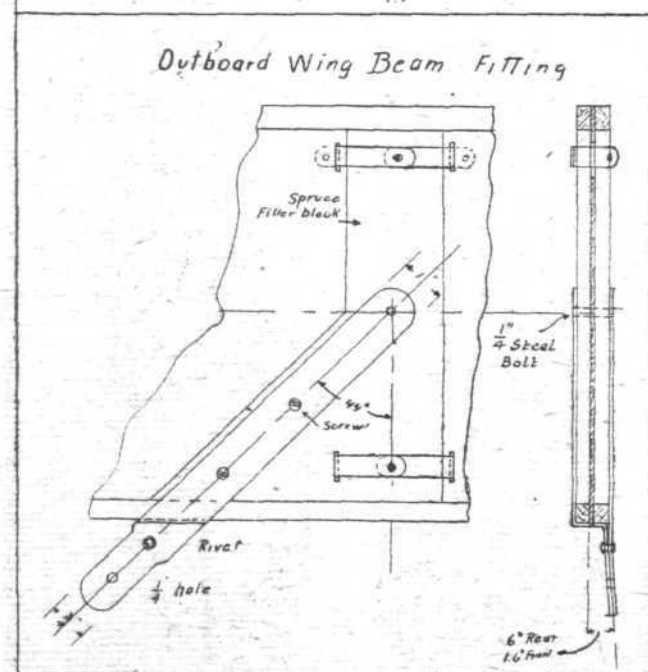
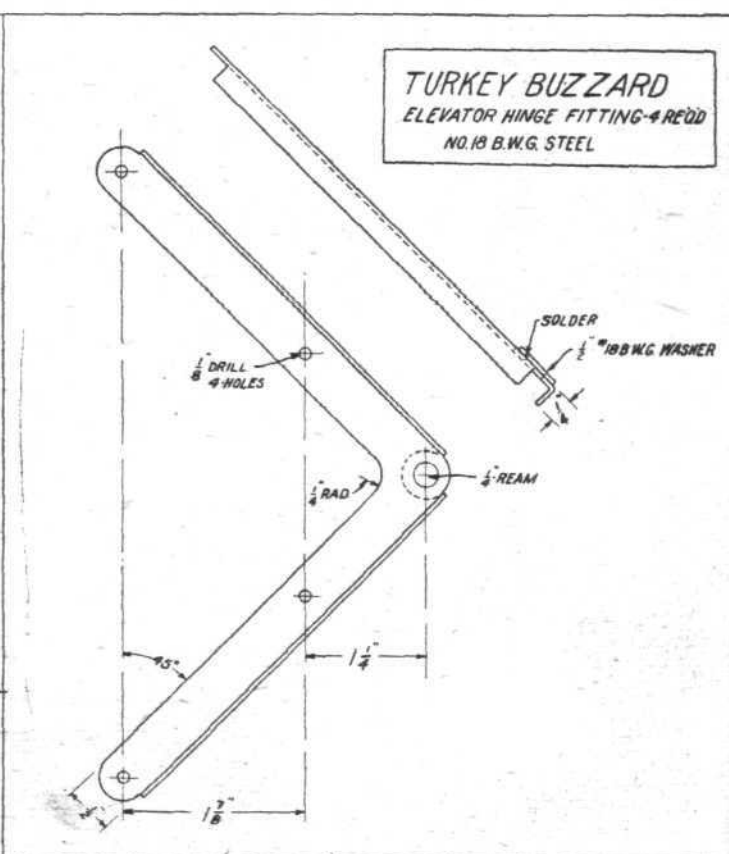
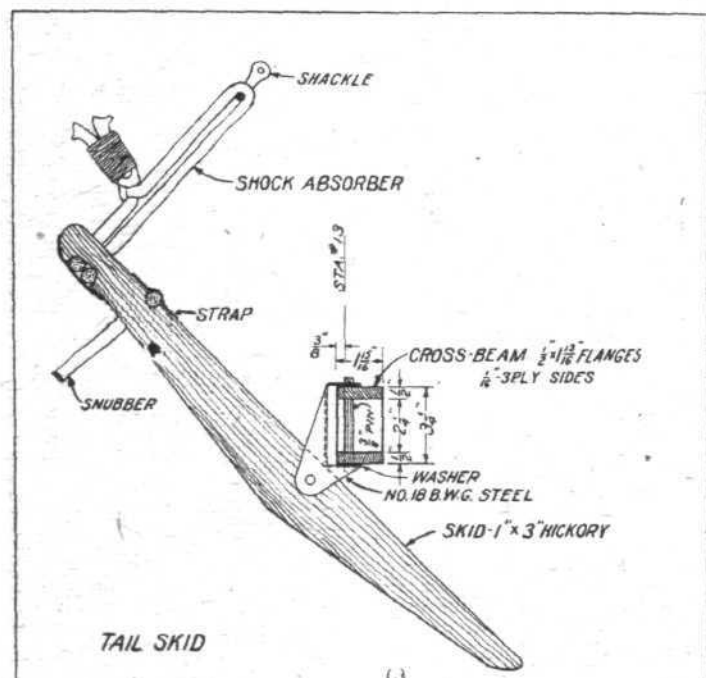


"TURKEY BUZZARD": Details of elevator construction.

Elevator Rib Ordinates.

Per- centage of Chord.	Rib No. 6.		Rib No. 5.		Rib No. 4.		Rib No. 3.		Rib No. 2.		Rib No. 1.	
	Distance from Nose.	Offset.	Distance from Nose.	Offset.	Distance from Nose.	Offset.	Distance from Nose.	Offset.	Distance from Nose.	Offset.	Distance from Nose.	Offset.
0	0	0	0	0	0	0	0	0	0	0	0	0
1.25	0.30	0.32	0.345	0.58	0.39	0.81	0.435	0.98	0.48	1.07	0.525	1.10
2.5	0.60	0.44	0.690	0.82	0.78	1.13	0.870	1.36	0.96	1.50	1.05	1.55
5.0	1.20	0.60	1.38	1.12	1.56	1.54	1.74	1.86	1.92	2.06	2.10	2.12
7.5	1.80	0.71	2.07	1.34	2.34	1.83	2.61	2.20	2.88	2.43	3.15	2.5
10.0	2.40	0.80	2.76	1.49	3.12	2.04	3.50	2.43	3.84	2.71	4.2	2.77
15.0	3.60	0.91	4.14	1.69	4.68	2.50	5.22	2.74	5.76	3.05	6.3	3.14
20.0	4.80	0.96	5.52	1.79	6.24	2.46	6.96	2.94	7.68	3.25	8.4	3.34
30.0	7.20	0.98	8.28	1.82	9.36	2.51	10.44	3.02	11.52	3.34	12.6	3.44
40.0	9.60	0.92	11.04	1.70	12.48	2.34	13.92	2.80	15.36	3.10	16.8	3.20
50.0	12.00	0.80	13.80	1.45	15.6	2.00	17.4	2.42	19.2	2.67	21.0	2.74
60.0	14.40	0.64	16.56	1.18	18.72	1.64	20.88	1.95	23.04	2.17	25.2	2.23
70.0	16.80	0.48	19.32	0.84	21.84	1.18	24.36	1.41	26.88	1.56	29.4	1.62
80.0	19.20	0.29	22.08	0.54	24.96	0.74	27.84	0.89	30.72	0.98	33.6	1.01
90.0	21.6	0.13	24.84	0.24	28.08	0.34	31.32	0.40	34.56	0.44	37.8	0.45
95.0	22.8	0.07	26.22	0.12	29.64	0.18	33.06	0.20	36.48	0.22	39.9	0.23
—	23.9	0.03	27.5	0.06	31.1	0.07	34.7	0.08	38.3	0.08	41.9	0.09
100.0	24.0	0	27.6	0	31.20	0	34.8	0	38.4	0	42.0	0

Note.—The front beam is at 15 per cent. of chord.



"TURKEY BUZZARD": Wing spar lift strut fitting, elevator hinge fitting, control stick, and tail skid.

being divided. Such a fitting would be slightly more difficult to make, but would have made a stronger job.

The lift struts are steel tubes, and the manner of forming the end fitting is shown in a small drawing above the "A" strut fitting. A slotted hardwood block is driven into the end of the tube, where it is prevented from turning by short wood screws. The slot, of course, accommodates the wing fitting, and the bolt hole is drilled on assembly.

The Elevator

In general design the elevator is of similar construction to that of the wing. The spars are I-sections, with $\frac{1}{8}$ -inch three-ply webs and split flanges of spruce. The ribs are similar to the wing ribs in construction, with the exception of the centre rib, which has a three-ply web in place of the thick paper webs. The section used is Göttingen No. 410, and the dimensions of the various ribs are given in the accompanying table. It should be pointed out that the section is a symmetrical one, *i.e.*, biconvex, and that the dimensions given in the table are half-depths.

The elevator crank lever or "horn" is shown in the same sheet of drawings. It is in the form of two plates, placed one on each side of the central rib A, and attached at corner blocks and packing pieces by small bolts. The elevator

hinges, shown in another drawing, are mounted on the sides of the fuselage, as indicated in the side view on p. 213 of our issue of April 19. The corresponding bearings on the front spar of the elevator are shown in the elevator drawings, marked Part "B," and are, we think, self-explanatory. The stern post of the fuselage is detachable, so as to admit of the elevator being put into place.

Controls.

The controls are in the form of a tubular "joy-stick," and, presumably, a foot bar of usual type, no drawings being provided of the latter. The "joy-stick" is a 1-in. 20 B.W.G. steel tube, with a universal joint at the base, and four "L" clips placed 10 ins. below the top for the attachment of elevator and aileron cables. No further explanation of the controls seems to be necessary.

Tail Skid.

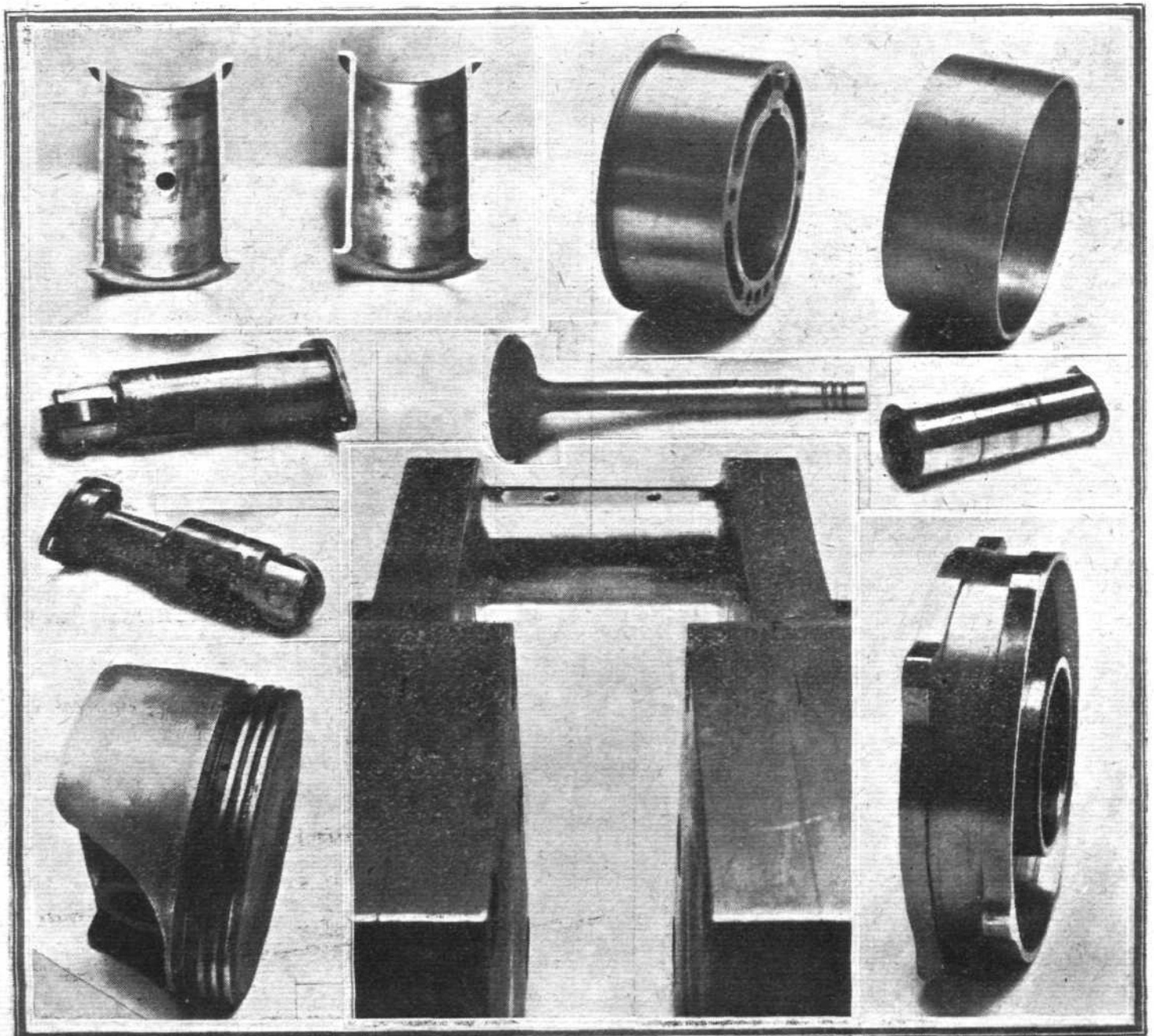
The tail skid is of hickory, and is of the usual swivelling type. The fitting is attached centrally to a transverse fuselage member of box section, having $\frac{1}{2}$ -in. by $1\frac{1}{8}$ -in. flanges and $\frac{1}{8}$ -in. three-ply sides. The arrangement of swivel fitting, rubber shock absorbers and "snubber" should be clear from the drawing.

(To be concluded.)

THE INCREDIBLE "JUPITER"

As briefly announced in FLIGHT last week, the Bristol "Jupiter" nine-cylinder radial air-cooled engine recently completed 150 hours of running, divided into series of 10-hour runs and one non-stop run of 50 hours. These

tests were undertaken to demonstrate the unique reliability of the "Jupiter" engine, and the results certainly dispose of any doubts as to whether or not a radial air-cooled engine of high power will stand up to its work.



Photographs of various main parts of the Bristol "Jupiter" engine which ran for 50 hours without a stop.

The engine submitted to the tests, which were carried out under official A.I.D. supervision, was a standard Mark IIIA type. After completing the usual Air Ministry endurance test and power curve on the dynamometer, the engine was taken down and all parts measured. The engine was then erected and run for 150 hours, absorbing 342 h.p. at 1,575 r.p.m. Cooling was by the slip stream from the propeller driven by the engine. Throughout the tests an exhaust ring and long exhaust pipes were used.

The total amount of petrol used on the tests was as follows: For 150 hours 55 mins. 3,969 gals., corresponding to 26.25 gals. per hour, or 0.614 pint per b.h.p. per hour. The total amount of oil used was 1,776 pints, corresponding to 0.0344 pint per b.h.p. per hour.

At the conclusion of the test the engine was stripped down and all parts carefully examined. The maximum wear on the major parts of the engine in no case exceeded 0.0005 of an inch.

The originals of the accompanying photographs show (although in the reproduction the detail is lost) that such parts as the big-end bearing, valves, pistons, crank-pin, cam sleeve, tappets, etc., are in perfect condition.

We imagine that a non-stop run of 50 hours is a world's record; at any rate, it certainly is so for any modern engine running for the whole period at 90 per cent. of its full power. We believe that a German (Maybach) engine was run actually for a longer period, but this was a heavy water-cooled type of airship engine, and neither was it, we believe, run at 90 per cent. of its full power. The performance is thus one of which the Bristol Aeroplane Company and Mr. Roy Fedden, their engine designer, may well be proud. The tests definitely take the radial air-cooled engine out of the category of rotaries, in which it has hitherto been classed by most people, owing to its alleged inferior reliability, and places it on a level with the best water-cooled engines in the world. Congratulations to everyone concerned.

THE ROYAL AIR FORCE

London Gazette, April 24, 1923
Group Capt. P. B. J. de la Ferte, C.M.G., D.S.O., is appointed Deputy-Director of Personnel, Air Ministry (vice Group Capt. A. G. Board, C.M.G., D.S.O.); April 16.

General Duties Branch

Flight-Lieut. A. Wombwell is granted a short service commission in the rank stated, for three years; April 25. R. O. Rigg (Lieut., R.N., retired) is granted short service commission as Flying Officer, for seven years' duty on active list; April 10.

The following are granted short service commissions as Flying Officers with effect from and with seniority of April 16:—J. B. L. H. Cordes, E. A. Sullock, A.F.C.

Lieut. D. G. Brodie, R.F.A., is granted a temporary commission as Flying Officer on seconding for four years' duty with R.A.F.; January 24. Wing-Comdr. I. T. Courtney, C.B.E., is placed on half-pay, Scale A; April 4. Flight-Lieut. G. N. Humphreys is transferred to the Reserve, Class A;

April 24. The short service commission of Pilot Officer C. A. Cole is terminated on cessation of duty; April 25.

Medical Branch

Flight-Lieut. E. W. Longden relinquishes his temporary commission on ceasing to be employed; April 4.

Reserve of Air Force Officers

Class A

The following are granted commissions on probation in General Duties Branch in ranks stated, with effect from dates indicated:—

Flying Officers E. L. Foot; April 21. J. C. Griffiths; April 11. Pilot Officer I. W. Campbell; April 21.

Class C

Flight-Lieut. L. L. Whitworth, A.F.C., is transferred from Class B to Class C; April 27.

IN PARLIAMENT

Naval, Military and Air Attaches

Lieut.-Commander Kenworthy on April 23 asked the Under-Secretary of State for Foreign Affairs how many naval, military, and air attaches, respectively, and assistant attaches, respectively, are accredited to foreign courts at which His Majesty is represented?

Mr. McNeill: Naval attaches, 6; military attaches, 15; air attaches, 2; assistant naval attaches, 1; assistant military attaches, 3.

Lieut.-Commander Kenworthy: Will the hon. gentleman take care that the Air Ministry approach the Foreign Office with a view to appointing more air attaches?

Mr. McNeill: I must ask for notice of that. I cannot answer.

Fishing Industry and Aeroplane Flights

Sir R. Hamilton asked the Minister of Agriculture where and when the experimental aeroplane flights made by officers of his Department for the purpose of locating shoals of fish were carried out; and if the further experiments now contemplated could be carried out during the summer fishing season in the North of Scotland?

Sir R. Sanders: The following are the details of the five flights undertaken:—

Flight No. 1, 19th October, 1921.—Off the Suffolk Coast.

Flight No. 2, 2nd November, 1921.—Ditto.

Flight No. 3, 10th November, 1921.—Off the North Suffolk Coast.

Flight No. 4, 13th March, 1923.—Off the Coast of South and South-West Cornwall.

Flight No. 5, 15th March, 1923.—Off the Coast of South Cornwall.

I would ask the hon. member to address the latter part of the question to my noble friend the Secretary for Scotland.

R.A.F. Personnel

Mr. Griffiths, on April 25, asked the Secretary of State for Air what was the approximate highest number of men clerks and other non-combatant ranks employed by his Department solely at home service stations prior to October, 1920; what was the highest number of women employed on similar uniform duties, and what proportion of these, respectively, were still employed in a civilian capacity at the end of 1922 and 1923; whether any gratuities were granted to the men and women concerned on demobilisation from their respective forces; and if so, the amount in either case?

Sir S. Hoare: The highest number of Royal Air Force personnel employed before October, 1920, on the kind of duties to which, although they are not classed in the Royal Air Force as non-combatant, my right hon. friend thinks that the hon. member is referring, was 54,200, and the corresponding figure for women was 14,700. The numbers of civilian subordinates employed on March 31, 1923, were: men, 1,300; women, 195; but it does not follow that these individuals were included in the former figures. As regards gratuities, every airman who served during the War, which ended for this purpose on August 3, 1919, and had completed six months' service, received on demobilisation a war gratuity of an amount dependent on the length of his service and his rank, and varying from £5 to nearly £40; and every airman serving on an ordinary engagement (other than "duration of War") received, in addition, a service gratuity of £1 for each year of service up to a maximum of £12. Airmen serving on "duration of War" engagements were also given 28 days' pay and allowances on demobilisation. The demobilisation benefits of the Women's Royal Air Force were two months' pay for officers, 28 days' pay and allowances for mobile and seven days' pay and allowances for immobile members of that Force, provided that such officers or members had enrolled before November 11, 1918.

France and Czechoslovakia Air Convention

Lieut.-Commander Kenworthy on April 26 asked the Secretary of State for Air whether he has yet seen the text of the recently concluded aviation convention between France and Czechoslovakia; and can he state what steps are being taken to preserve rights on this market to the British aeroplane manufacturers?

Sir S. Hoare: No, Sir. I have not seen the text of the agreement. I understand that it has not yet been ratified. In the meanwhile, I am in communication with Prague as to whether any steps will be necessary to safeguard British interests. I cannot give an answer until I know in detail the terms of the agreement.

Air Attaches

Lieut.-Commander Kenworthy asked why there are only two air attaches accredited to foreign Courts as compared to seven naval attaches and assistant attaches and 18 military attaches and assistant attaches; to which Courts they are accredited; and what duties they perform; and whether he has made or is making any effort to have the number of air attaches increased?

Sir S. Hoare: For reasons of economy representation by air attaches has been restricted to those countries whose aeronautical development is most advanced, namely, France and the United States of America. The question has, however, recently been reviewed, and it is at present under consideration, but not yet finally decided, to appoint air attaches to two other countries where such representation is thought likely to be advantageous.

Lieut.-Commander Kenworthy: Has the right hon. gentleman pressed on the Government the need for a re-distribution in order to have, without any extra expense, more air attaches and fewer military attaches, in view of the development of aerial transport?

Sir S. Hoare: We have been considering the question recently as it affects the three services, and the latter part of my answer refers to the arrangement which we hope to bring into operation in the near future.

Capt. Viscount Curzon: Is the right hon. Gentleman aware that owing to the lack of air attaches in South America, the Germans have been able to pretty well capture all the aviation facilities in the whole of that Continent?

Sir S. Hoare: I may tell the Noble Lord that it is with reference to South America we have been recently reviewing the whole question.

Sir H. Brittain: How many air attaches are detailed by France to other countries?

Sir S. Hoare: I cannot answer that question without notice.

Mr. T. D. Bathgate—War Inventions

Sir A. Sinclair asked the Under-Secretary of State for War whether the Ordnance Department of the War Office received from Mr. T. D. Bathgate, of Watten, Caithness, in the autumn of 1914, plans and specifications of the tracer or anti-Zeppelin bullet to be fired from rifles or machine guns mounted in aeroplanes and of an anti-Zeppelin trailing bomb which were to be used against Zeppelins in the air defence of London; whether the War Office withheld Mr. Bathgate's name when other claimants for these inventions had awards made; and why claimants for an award in respect of anti-Zeppelin bullets were heard by the Royal Commission on Awards at London in July, 1921, in secret, before a single member of the Royal Commission instead of by the whole Commission?

Lieut.-Colonel Guinness: The War Office received from Mr. Bathgate in the autumn of 1914 certain diagrams or plans relating to anti-Zeppelin devices. These plans, however, were returned to him at his own request in March, 1915, and it is not now possible to state whether they were of the nature indicated in the question. In any event, they were not in any way utilised by the Department. The War Office did not withhold Mr. Bathgate's name when other claims were under consideration; on the contrary, he has had full opportunities of presenting claims, and has, in fact, presented them both to the War Office, the Ministry of Munitions, the Royal Commission on Awards to Inventors and the War Compensation Court. In regard to the last part of the question, claims addressed to the Royal Commission on Awards are heard in the first instance by an Investigating Committee (which consisted in Mr. Bathgate's case of Mr. Justice Sargant and the Secretary), and cases which are shown by this preliminary investigation to have no reasonable chance of success are not heard by the full Commission. The object of this arrangement is to accelerate business.

PERSONALS

Married

Flight Lieut. J. O. ANDREWS, D.S.O., M.C., was married on April 14, at St. John's, Frenchay, to BERTHA BISDÉE, daughter of Mr. and Mrs. Wilfred Bisdée, Hambrook, Gloucestershire.

Capt. FREDERICK CYRIL JENKINS, late 3rd London Regt. and R.A.F., was married on April 14, at the Savoy Chapel Royal, to INEZ MARY MACKAY FERGUSON, only daughter of Mrs. J. M. Ferguson, of 17, Fairfax Road, London, W. 4.

Flying Officer ULRIC DE BURGH, R.A.F., was married on April 30, at St. John's, Edinburgh, to KATHLEEN, daughter of Mr. and Mrs. GEORGE USHER, of 16, Grosvenor Crescent, Edinburgh.

Major FRANCIS YEATS-BROWN, D.F.C., 15th Lancers, Indian Army, son of the late Montagu Yeats-Brown, C.M.G., and Mrs. Yeats-Brown, of Portofino, Italy, was married very quietly at St. Peter's, Cranley Gardens, on April 30, to OLGA LAVINIA, eldest daughter of Mr. and Mrs. PORTER, 20, Roland Gardens, formerly of Clogher Park, Ireland. The bride and bridegroom left immediately for San Giorgio, Portofino, Italy.

To be Married

The engagement is announced of DOUGLAS A. DAVIES, D.F.C. (late 1/4th Wilts Regt. and R.A.F.), eldest son of Mr. and Mrs. Arthur Davies, of Harrow, to MURIEL, daughter of the late EDWARD WILSON, J.P., and Mrs. WILSON, formerly of Hawick, N.B., and 19, Netherhall Gardens, N.W.

The engagement is announced of Capt. FREDERICK WILLIAM HARTMAN, late R.E., attached R.N.A.S., of 26, Albemarle Street, only surviving son of Mr. and Mrs. Augustus Hartman, of 14, Kensington Square, W., and Tyting, Aldwick, Sussex, and DOROTHY AILSA, only daughter of the late Mr. GEORGE HART DISCOMBE and Mrs. DISCOMBE, of 20, Edith Grove, Chelsea.

The engagement is announced of GUY MAINWARING KNOCKER, R.A.F., only son of Col. and Mrs. C. G. Knocker, of Folkestone, and CYNTHIA MARY, only daughter of Mr. and Mrs. CHARLES BURGOYNE LAMB, Inholms, Tadcaster.

The engagement is announced between Flying Officer J. G. SMITHSON, R.A.F., son of Mr. and Mrs. J. Smithson, of Norbiton, and KATHLEEN, daughter of Mr. and Mrs. JACK GLADWIN, of Kingston-on-Thames.

Item

Major NOBILE C. GRAZIANI, Air Attaché at the Italian Embassy, left town during last week-end for Switzerland.

Joy-Riding at Southend.

SEAPLANE joy-riding within easy reach of London is to be a feature this summer. A new company has been formed, under the name of "The Seaplane and Pleasure Trip Company, Ltd.," which is about to establish itself at Southend-on-Sea. The company will use Short seaplanes with seating accommodation for four, and it is the intention to ferry passengers out to the machines in motor-boats, taking them for a short "flip" at a very reasonable charge, and depositing them again off the pier, in the waiting motor-boat. The undertaking is to be welcomed because it affords people who have made flights in land machines an opportunity of experiencing the pleasure of flying over the sea, with its shipping, etc. Thus great numbers of Londoners who might not otherwise have had an opportunity of going up will be able to do so, while a scarcely less important thing is that thousands will be watching the machines and the flying from the shore, thus becoming familiar with and interested in aircraft. Another side which should not be overlooked is that the company is providing work for seaplane pilots, who are thus enabled to remain actively engaged in aviation, and who would be available in case of national emergency. We understand that there are still a few vacancies for pilots, who should apply to the company at the headquarters: Carlton House, Regent Street, S.W. 1.

Aero Golfing Society: "Flight" Cup

On Thursday, April 26 last, the Aero Golfing Society held their Spring Meeting at Hadley Wood Golf Club, and some good play took place for the Society's Spring Challenge Cup, presented by the proprietors of FLIGHT. The winner of this event was Lieut.-Col. W. A. Bristow (90 less 14 = 76), and the runner-up P. Barry (88 less 6 = 82). Bogey Four Ball Matches: Eng. Com. W. Briggs and P. Barry (2 up), and Sir Henry White Smith and Lieut.-Col. W. A. Bristow (2 up). On the play off Briggs and Barry won. Mr. F. Cumbers, of the British Cellulose Company, kindly presented mementoes to the winners.

The Institution of Aeronautical Engineers

THE last lecture of the session of the Institution of Aeronautical Engineers will be held, at the Engineers' Club,

Coventry Street, May 11, when Major Maurice Wright, A.F.C., will give a lecture on "Low Power Flying." Cinematograph pictures will be shown, and a very interesting meeting is anticipated. A discussion will follow the lecture, and any who are genuinely interested, and would like to attend and join in the discussion, are invited to do so without ticket. The meeting opens at 6.30 p.m. There will be no advance copy.

SOCIETY OF MODEL AERONAUTICAL ENGINEERS (London Aero Models Association)

THE Council Meeting held on the 25th ult. was too short to deal with the agenda, and will be continued at Headquarters on Wednesday, May 9, at 8 p.m. Good work was done, however. Amongst other things an amendment was passed to the rule treating with "Protectors on Models," which has been a grievance for a long time.

On Friday last Mr. Burchell gave an extremely interesting demonstration of fuselage covering, which was very well received.

Visitors are cordially invited to the Society's meetings, which take place every Friday at 7.30 p.m. at 20, Great Windmill Street, Piccadilly.

Competition Secretary: C. Bayard Turner, 21, Lanercost Road, Tulse Hill, S.W. 2.

Hon. Secretary: A. E. Jones, 48, Narcissus Road, West Hampstead, N.W. 6.

IMPORTS AND EXPORTS, 1922-1923

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910). For 1910 and 1911 figures see "FLIGHT" for January, 25, 1912; for 1912 and 1913, see "FLIGHT" for January 17, 1914; for 1914, see "FLIGHT" for January 15, 1915; for 1915, see "FLIGHT" for January 13, 1916; for 1916, see "FLIGHT" for January 11, 1917; for 1917, see "FLIGHT" for January 24, 1918; for 1918, see "FLIGHT" for January 16, 1919; for 1919, see "FLIGHT" for January 22, 1920; for 1920, see "FLIGHT" for January 13, 1921; for 1921, see "FLIGHT" for January 19, 1922; and for 1922 see "FLIGHT" for January 18, 1923.

	Imports		Exports		Re-Exports	
	1922.	1923	1922.	1923.	1922.	1923
	£	£	£	£	£	£
Jan. ..	1,152	466	76,552	60,079	23	280
Feb. ..	567	641	69,129	120,236	1,100	3,040
Mar. ..	1,471	589	166,607	71,945	100	689
	3,190	1,696	312,288	252,260	1,223	4,009

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1921

Published May 3, 1923

- 31,972. COMMERCIAL AEROPLANE WING SYNDICATE, LTD., and H. Booth. Method of constructing skins of wings, fuselages, etc. (195,686.)
32,462. RAUL, MARQUIS OF PATERAS PESCARA. Aeronautical machines. (172,327.)

APPLIED FOR IN 1922

Published May 3, 1923

56. D. J. MOONEY. Ribs, cross-members, etc. (195,726.)
4,446. D. J. MOONEY. Metal constructional members. (195,825.)
27,240. D. J. MOONEY. Ribs, cross members, etc., for aircraft wings. (195,916.)

APPLIED FOR IN 1923

Published May 3, 1923

- 2,317. SPERRY GYROSCOPE CO. Gyro compasses. (192,400.)

FLIGHT

The Aircraft Engineer and Airships

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Telephone: Gerrard 1828.

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